

# THE 2002 RECREATIONAL USE SURVEY OF THE WEST FORK WHITE RIVER IN CENTRAL INDIANA

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## ABSTRACT

This study estimated recreational use of the West Fork White River from Mounds State Park in Madison County to the Sixteenth Street Dam in Indianapolis. Its purpose is to track the fishery as it recovers from the December 1999 fish kill. This study includes a total of 62 miles of river, a stretch of 7 river miles above the fish kill's starting point at Anderson, and the entire 55-mile stretch of the 1999 fish kill. This survey took place in the third growing season after the fish kill, following extensive stockings and what appeared to be a rapid but incomplete recovery of the river, as shown by fisheries surveys.

A bus route survey design was used to survey 24 stations along the river. A schedule provided variable time based on station importance at each stop through the clerk's day. Each day the clerk covered half of the 12 stations assigned to him. The entire 24 stations were covered 2.5 times each week from April 15<sup>th</sup> to October 31<sup>st</sup> in 2002. Two stations were dropped on June 1<sup>st</sup> and replaced with two new ones when the author saw use was minimal at the discontinued stations.

In terms of user visits, recreational boating was highest at 24% of the 48,859 total visits. Angling was second (21%), followed by parking and miscellaneous (19%), bicycling (16%), hiking and walking (14%), jogging (3%), and picnicing (2%). In the upper sector (Hamilton and Madison Counties), recreational boating was 29% of visits, and angling only 14%. In the lower sector (most of Marion County), recreational boating dropped to 21% and angling rose to 27% of visits. Less bank access in the upper sector and the ease of access in the lower sector may have played a part in these differences. The much higher population density along the lower sector also plays a part.

One of the salient findings of the survey was the importance placed by anglers on black bass fishing. Smallmouth bass are one of the most widely distributed and one of the more common species in the river as shown by fisheries surveys. Anglers directed 66% of their effort towards smallmouth and largemouth bass, with 58% in the upper river sector where smallmouth predominated and 68% in the lower sector where largemouth predominated.

Much of the angling was catch-and-release. For example, anglers only harvested 533 black bass (80% smallmouth), but released over 15,000. At least 29% of the released black bass were of harvestable size. Total harvest of all species was estimated at 8,124, and total catch-and-release was estimated at 26,437 fish. Bluegill harvest exceeded that of other species, making up 58% of the harvest, followed by channel catfish at 17% of total harvest number. Yellow bass harvest percent was 7%, crappie 4%, and rock bass 3%.

## INTRODUCTION

The portion of the West Fork White River (WFWR) covered in this study stretches from just above Anderson in Madison County to well into Marion County (Indianapolis) (Figure 1). This is the first user survey to utilize clerks following the devastating December 1999 fish kill which ran from the Anderson Wastewater Treatment Plant 55 miles downstream to the Lake Indy Dam in Indianapolis (Ball 2002a,b). This recreational survey began with the third growing season after the fish kill, and follows extensive stockings in the fish kill portion of the river. Three fishery surveys were conducted in 2000, and annual fall fishery surveys have been conducted beginning in 2001 to track the recovery of the stretch of river (Hoffman 2004a).

Recovery of the fishery has progressed well in certain respects, as indicated by the 2002 fishery survey (Hoffman 2004a). For example, species diversity and total electrofishing catch rates for fish have returned to normal. However, smallmouth bass length frequencies, as well as those of other species sought by anglers, still show depleted numbers of larger, catchable size fish.

The importance of the WFWR basin to recreation in Indianapolis, Anderson, and Hamilton Counties is slowly being recognized. The Indiana Natural Resources Commission has placed the WFWR on the Outstanding Rivers List for Indiana (Indiana Department of Environmental Management 2000). The entire stretch of the river in this study is legally recognized as navigable, allowing boaters and waders to have less restricted use of the river. Although three cities, three major dams, two water diversions, and at least five sand and gravel pits are located along the length of the river included in this study, this portion of the WFWR has some relatively natural shoreline and some of the flood plain forest still exists. However, most of the shoreline is privately owned, and residential and commercial development crowds its shoreline along much of its length. Public and private access sites are scarce. Lengthy riffles are waded by anglers. Stretches of the river in Anderson, Noblesville and Indianapolis, for example can be both waded and boated, and provide remarkably good fishing for smallmouth bass.

The upper sector of the study area, from above Anderson through Hamilton County, has shown considerable improvements in municipal waste treatment facilities. Improvement in fishing quality is evident in the twenty years following the report by Braun (1984). However, the area is rapidly changing due to increases in residential and municipal developments, much riparian habitat has been lost, and public land along the shores is limited. In spite of this, smallmouth bass fishing remains important in this area. Canoeing is popular along this stretch, with canoe liveries at both Anderson and Noblesville. An annual river cleanup has taken place in Madison County for several years, and seems to be growing in support.

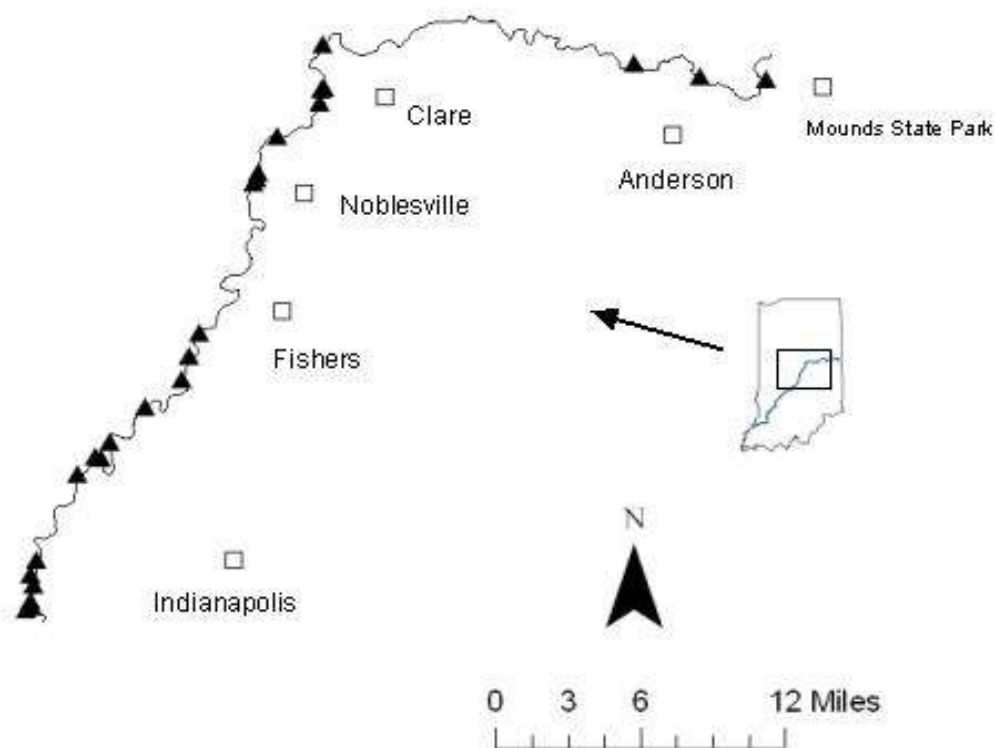


Figure 1. West Fork White River in Madison, Hamilton, and upper Marion Counties with the survey stations.

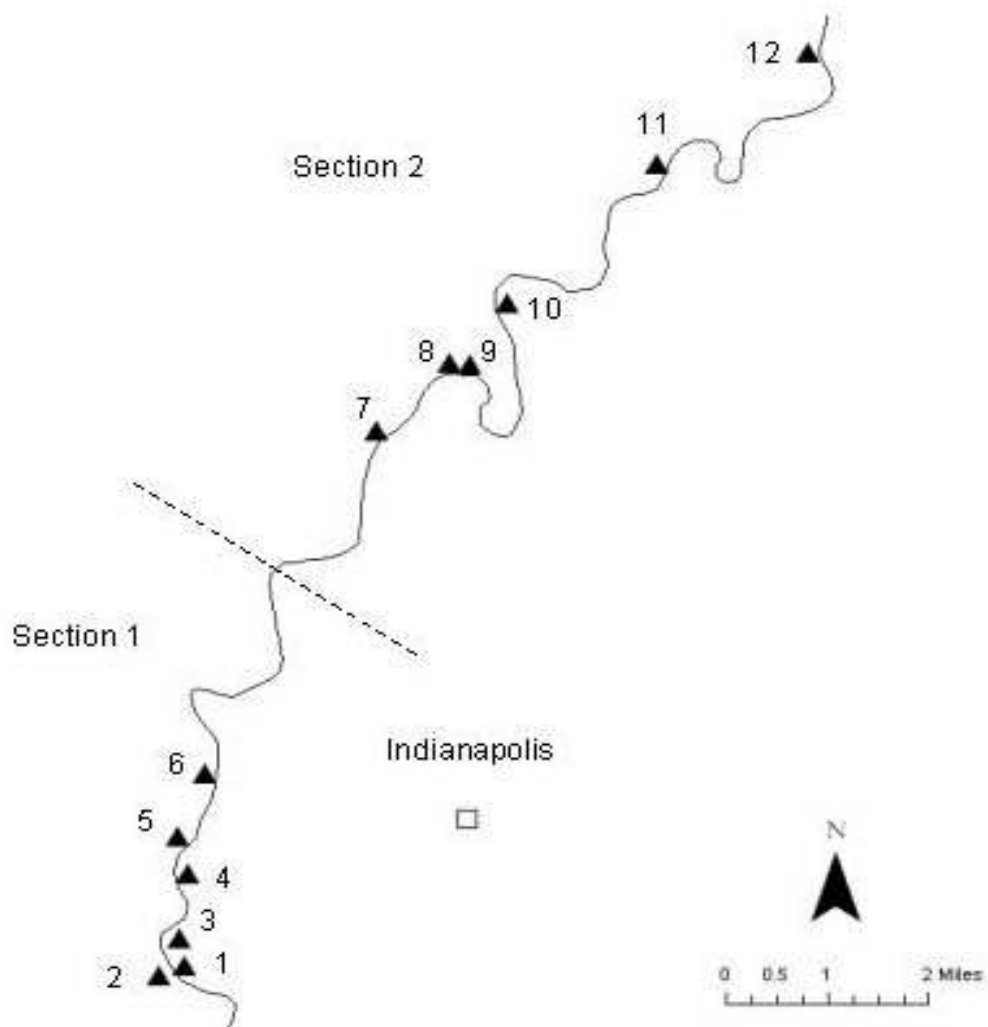


Figure 2. West Fork White River in upper Marion County, with stations and sections for lower river sector.

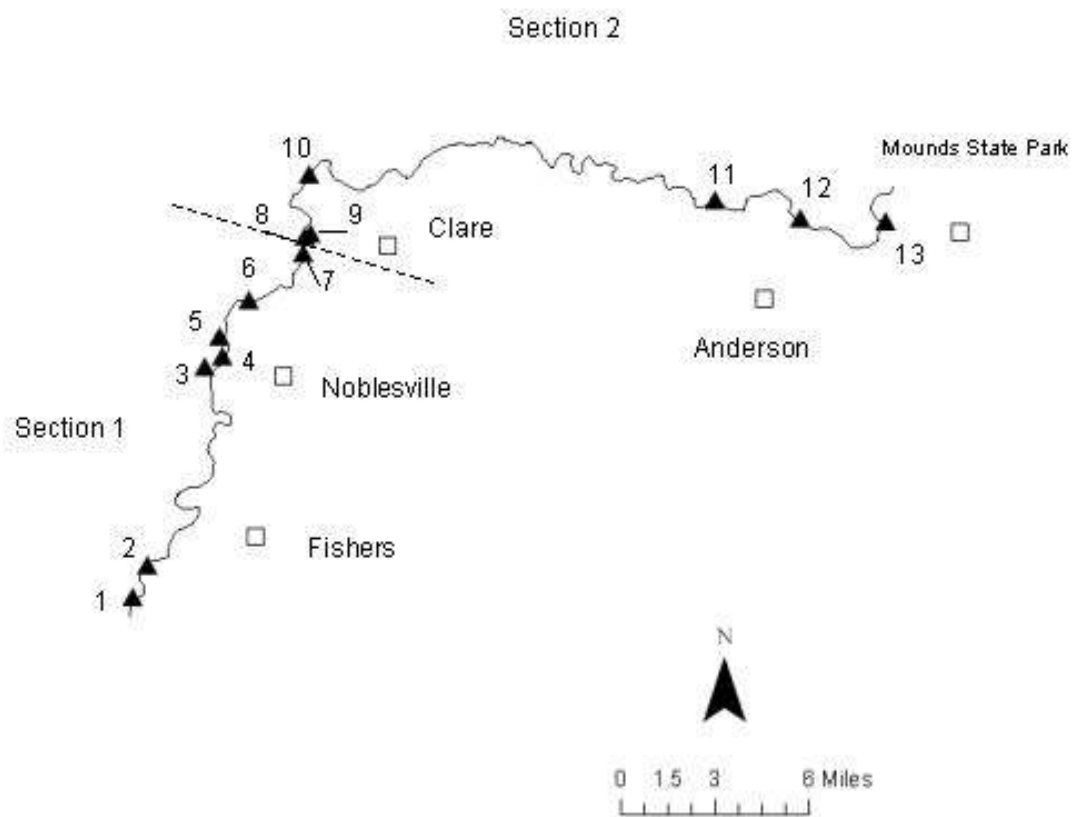


Figure 3. West Fork White River in Hamilton and Madison Counties, with stations and sections for upper river sector.



The lower sector is inside urban Marion County and accordingly has a much denser population than the upper sector. Four city parks, Riverside, Holliday, Marott, and Broad Ripple, provide bank and boat access in Indianapolis above 16<sup>th</sup> Street (Kiley 1987). Below 16<sup>th</sup> Street Dam there is additional access, but the river receives pollution from consolidated storm sewers, and is much more degraded than above this point. The quality of fishing declines below the 16<sup>th</sup> Street Dam (Kiley 1987, Keller 2001). Although public access is available at several lakes in the Indianapolis area, access fees are required and bank fishing is limited. Therefore, improvement of the recreational value of the river stretch covered in this study is particularly important to residents of the Marion, Hamilton, and Madison County area.

A legal settlement for damages of the 1999 fish kill has provided \$6 million to restore the riparian zone, restock fish, conduct fishery and recreational surveys, improve access, and clean up trash in the river in the portion directly affected by the fish kill (White River Restoration at <http://www.in.gov/idem/mycommunity/wrcac/whiteriver/>). One example of how this money is being spent is to annually help the White River Watchers, Keep Indianapolis Beautiful and other volunteer river cleanup projects with monetary costs for equipment and supplies. Other examples include easements, which are being made to secure river bottom acreage for conservation in perpetuity. The restoration of natural vegetation on river bottomlands is another type of project using the money. In addition, canoe launches have been improved or built at several parks and dams along the river. Launches for trailered boats have been built or improved, and a new boat ramp site on the river is still in the process of being purchased. Various surveys of fish, invertebrates, and recreational use have also been funded by the settlement.

A preliminary voluntary angler survey in 2000 indicated anglers were returning to the river and finding catchable populations of smallmouth and largemouth bass and other species, even in the total kill portion of the river (Ball, unpublished). For example, at the Clare impoundment in the middle of the total kill zone, 10 anglers reported catching 44 largemouth bass in their trips in 2000. In addition, an annual bass tournament at Broad Ripple in the lower sector took place in 2000. Fishery surveys conducted by the IDNR showed catchable populations of angler-sought species at that time (Ball 2002a).

## METHODS

The stretch of river selected for the 2002 recreational survey is 62 river miles in length and includes the two zones of the fish kill (Ball 2002b), plus an additional 7 miles of river above the fish kill (Figures 1 to 3). The Total Kill Zone of the fish kill ran from the Anderson wastewater treatment plant (just below station 12 in Figure 3) to a point just upstream of the Broad Ripple Impoundment, (station 11 in Figure 2) or 43 river miles. The Partial Kill Zone stretched 12 river miles from the Total Kill Zone to the 16<sup>th</sup> St. Dam in Indianapolis (Station 1, Figure 2). For the current survey, an

additional seven miles above the original Total Kill Zone was added to include the canoe launch at Mounds State Park, becoming the upper river sector.

A bus-route creel design was used which incorporates a schedule of stops by each clerk at various access points along the river. This design has been found to efficiently use the clerk's time when the number of access points is large (Pollock et al. 1994). The survey ran from April 15 to October 31, 2002. The study area was divided into two river sectors and each sector was divided into two sections. Each sector initially contained 12 access points (Appendix 1), the stations 11a (lower sector) and 12 (upper sector) not used at the beginning. Each of the two clerks was assigned a sector and worked one section per day, alternating between the sections. Two sites were changed June 1, 2002 because of low effort recorded at each of the two discontinued access sites, with the substitution of site 11a for 11b (lower sector) and 12 for 11 (upper sector).

Three impounded sections of the river required special treatment due to multiple private access points concentrated on these water bodies. The bus route creel was supplemented with a roving survey using a boat with an outboard motor in June through August on these three bodies of water to increase the number of interviews. Neither a roving survey using a boat or a bus route survey was ideal for this project. Part of the river was not readily accessible by boats using standard outboard motors during low water levels, and part of it was not accessible to a clerk visiting access sites due to a generous number of private ramps and access points on the Broad Ripple and Clare impoundments. A combination was chosen, even though the boat portion of the survey was limited to three months, as a way to get a better handle on the recreational activity.

Although many access points were not accessible for the survey due to private ownership, the clerks were allowed access to two of the busier private ramps, Riverwood and Riverbend, in Hamilton County. Estimates of river use are conservative due to the presence of the private access points, not all of which were accessible to the clerks.

Analysis followed methods proposed by Hayne (1991). The formula is designed to estimate total user hours. The analysis was expanded to include user visits as well for all users. From angler interviews, it was determined that the average angler visit or trip was 2.9 hours for the upper sector and 3.3 hours for the lower sector. Other users were not interviewed, so the trip length for these users was not calculated directly. Consequently, the number of user visits for fishing is reliable while that for other users is less reliable. For example, the recreational boating user visits may be inflated, as the average trip length of 2.0 hours seems to be low. In addition, the number of picnicing visits may be underestimated, as the average trip length exceeds four hours.

## RESULTS

Angling accounted for 10,381 user visits, 71% of which was in the lower river (Table 1). For both sectors combined, angling totaled 33,059 hours, more user hours than any other activity. Seventy-four percent of angling hours were observed in the lower river. The total angling hours amounted to 26% of the total recreational hours.

Second to angling in terms of user hours were parking or miscellaneous and recreational boating, accounting for 23,528 and 23,526 hours each. Eighty-nine percent of the total for parking or miscellaneous and 61% of the total for recreational boating user hours occurred in the lower sector.

Table 1. Recreational use of selected West Fork White River access sites in 2002.

		Angling	Recreational Boating	Picnic-ing	Bicycling	Jogging	Hiking & walking	Parking & Misc.	Totals
Upper Sector	User visits	2999	6153	106	2708	1270	5658	2503	21,397
	%	14	29	.05	13	6	26	12	
	User hours	8696	9290	174	3958	2298	8913	2503	35,832
	%	24	26	.05	11	6	25	7	
Lower Sector	User visits	7383	5760	1022	5156	144	1271	6727	27,463
	%	27	21	4	19	.05	5	24	
	User hours	24363	14236	4517	21388	428	3864	21025	89,821
	%	27	16	5	24	.05	4	23	
Totals	User visits	10381	11913	1128	7864	1414	6929	9230	48,859
	%	21	24	2	16	3	14	19	
	User hours	33059	23526	4691	25346	2726	12777	23528	125,653
	%	26	19	4	20	2	10	19	

The greatest angling activity occurred in July in the upper sector at 1,084 user visits (Appendix 2). In the lower sector, angling activity peaked in June and July with 1,702 user visits each. A very wet spring with severe flooding that extended into June had a negative influence on the monthly angling effort prior to July. Recreational boating activity was also greatest in July with 1,718 visits in the upper and 1,688 visits in the lower sector. June was second for boating in the lower but September was second in the upper sector. Canoeing is much more popular in the upper sector, while motorboats are more popular in the lower sector.

Anglers harvested 8,124 fish, of which 90% were taken from the lower sector (Table 2A, Figure 4). Bluegill dominated the total harvest, with 99% caught in the lower sector. However, interest in bluegill was evident in the upper sector as well. The channel catfish harvest totaled 1,401, of which 72% were harvested in the lower sector. Channel catfish dominated the upper sector harvest (50% of fish), and contributed 14% to the lower sector harvest. Anglers harvested 425 smallmouth bass, equally divided between the upper and lower sectors that made up 5% of the total harvest, but 26% of upper sector harvest due to the small total harvest there. Rock bass had a

low harvest of 235 individuals. Largemouth bass harvest was entirely in the lower sector, with only 108 harvested. Of the 26 flathead catfish harvested, all were from the lower sector.

The harvest rate of smallmouth bass was low, only 0.02 fish per hour (Table 2B). The bluegill harvest rate was 0.19 fish per hour for the combined sectors, and 0.32 in the lower sector. Channel catfish had a modest combined harvest rate of 0.06 for both sectors. The total harvest rate for all fish was 0.32 fish per hour with the lower sector having the higher rate of 0.51 fish per hour.

Smallmouth bass accounted for 39% of the fish caught-and-released overall (Figure 5). Seventy-four percent of the fish caught-and-released in the upper sector and 32% in the lower were smallmouth bass. Although in part this reflects the relative densities of smallmouth bass in the two sectors, it is also a reflection of the high angler interest in this fish throughout the river. Largemouth bass were second to smallmouth bass in the number of fish caught-and-released at 28% in the lower sector and 19% overall. All largemouth bass caught-and-released were recorded from the lower sector. Channel catfish accounted for 7% of the fish caught-and-released in the lower sector, and 8% overall. Flathead catfish were less than 1% of the catch-and-release numbers. All flathead catfish catch and release activity occurred in the lower sector.

Catch rates for catch-and-release angling were greater in the upper sector at 1.23 fish/h compared to the lower sector at 0.54 fish/h (Table 3B). Smallmouth bass catch-and-release rates were 0.61 fish/h in the upper sector and 0.17 fish/h in the lower sector. Rock bass catch-and-release rates were second at 0.40 fish/h and channel catfish third at 0.12 fish/h in the upper sector. In the lower sector, largemouth bass catch-and-release rates were 0.15 fish/h.

Preference catch hours provide a measure of the interest of the anglers in catching individual species or species groups. Preference catch hours for black bass (*Micropterus* species) were far greater than for other species or species groups, accounting for 58% of preference hours for the upper, 68% for the lower and 66% for the combined sectors (Table 4). Catfish preference catch hours were second in the upper sector. Only 0.4% of the effort was directed at rock bass, one of the more abundant game species in the river (Hoffman 2004a).

The preference harvest rate (the directed fishing harvest rate of Pollock et al. 1994) tends to be a better vehicle for comparing harvest rates among various bodies of water because of its lower variability compared to the plain harvest rate. In this study, the high preference harvest rate for panfish in the lower river dwarfed other preference harvest rates (Table 5). Largemouth and smallmouth bass preference harvest rates were very small, due to the tendency for catch-and-release of these species.

Table 2. Number of fish harvested and harvest rates.

## Part A. Number of fish harvested and standard deviation

Species	Upper Sector		Lower Sector		Total Harvest	
	No.	STDV	No.	STDV	No.	STDV
SMB	209	0.57	216	0.50	425	0.76
LMB	0	0.00	108	0.29	108	0.29
BG	61	0.44	4,645	13.8	4,707	0.47
CRP	0	0.00	319	0.51	319	0.51
ROB	123	1.40	112	0.25	235	1.42
CCF	397	1.44	1,004	1.44	1,401	2.04
FCF	0	0.00	26	0.16	26	0.16
YLB	0	0.00	606	1.09	606	1.09
CCP	0	0.00	187	0.60	187	0.60
SUC	0	0.00	112	0.29	112	0.29
Tot. Fish	790	2.17	7,335	14.02	8,124	14.19

## Part B. Harvest rates (no./h)

Species	Upper Sector		Lower Sector		Combined Harvest	
	No.	STDV	No.	STDV	No.	STDV
SMB	0.04		0.01		0.02	
LMB	0.00		0.01		0.004	
BG	0.01		0.32		0.19	
CRP	0.00		0.02		0.01	
ROB	0.02		0.01		0.01	
CCF	0.07		0.06		0.06	
FCF	0.00		0.00		0.00	
YLB	0.00		0.04		0.02	
CCP	0.00		0.01		0.01	
SUC	0.00		0.01		0.00	
Tot. Fish	0.14	0.99	0.51	2.63	0.32	1.19

Abbreviations: SMB=smallmouth bass, LMB=largemouth bass, BG=bluegill, CRP=crappies, ROB=rock bass, CCF=channel catfish, FCF=flathead catfish, YLB=yellow bass, CCP=common carp, SUC=sucker, STDV=standard deviation.

Table 3. Number of fish caught-and-released and catch-and-release rates.

## Part A. Number of fish caught-and-released.

	Upper Sector		Lower Sector		Total	
	Catch-and-Release No.		Catch-and-Release No.		Catch-and-Release No.	
	No.	STDV	No.	STDV	No.	STDV
SMB <12"	4,214	11.40	3,549	3.48	7,763	11.92
SMB >12"	1,486	6.38	1,128	1.97	2,615	6.67
LMB <14"	683	4.49	2,479	2.67	3,162	5.22
LMB >14"	65	0.86	1,793	4.54	1,858	4.62
ROB	3,725	10.29	124	0.38	3,850	10.30
CCF	1,151	8.42	1,040	2.38	2,191	8.74
FCF	0	0.00	43	0.29	43	0.29
Other	71	0.88	4,886	6.62	4,957	6.68
Totals	11,394	28.46	15,043	10.49	26,437	21.50

## Part B. Catch-and-release (C&amp;R) catch rates (no. per hour)

	Upper Sector		Lower Sector		Combined	
	C & R Catch Rate		C & R Catch Rate		C & R Catch Rate	
	Catch Rate	STDV	Catch Rate	STDV	Catch Rate	STDV
SMB <12"	0.45		0.13		0.26	
SMB >12"	0.16		0.04		0.09	
LMB <14"	0.07		0.09		0.11	
LMB >14"	0.01		0.06		0.06	
ROB	0.40		0.00		0.13	
CCF	0.12		0.04		0.07	
FCF	0.00		0.00		0.00	
Other	0.01		0.17		0.17	
Totals	1.23	4.37	0.54	3.96	0.88	5.90

Abbreviations: SMB=smallmouth bass, LMB=largemouth bass, BG=bluegill, ROB=Rock bass, CCF=channel catfish, FCF=flathead catfish, C&R=catch-and-release, STDV=standard deviation.

Table 4. Angler preference hours and angler percent preference by species.

	Angling		Preference		Categories		
	Black bass	Bass & Panfish	Catfish	Rock bass	Panfish	Suckers & Carp	Any
Angler preference hours (h) for combined estimate	8,035	168	1,494	44	302	180	1,951
STDV of preference catch h	143.8	2.0	6.8	1.2	2.0	1.6	11.1
Combined est. % of h	66.0	1.4	12.3	0.4	2.5	1.5	16.0
Angler preference hours for upper sector	1,189	123	384	44	102	0.0	210
STDV preference catch h	7.0	1.9	2.7	1.2	1.5	0.0	3.9
Preference category % of h	57.9	6.0	18.7	2.2	5.0	0.0	10.2
Angler preference hours for lower sector	6,846	44	1,111	0.0	201	180	1,741
STDV preference catch h	43.7	0.7	6.3	0.0	1.3	1.6	10.4
Preference category % of h	67.6	0.4	11.0	0.0	2.0	1.8	17.2

Table 5. Preference harvest rates in number of fish per hour.

	Black bass	Bass & panfish	Catfish	Rock bass	Panfish	Suckers & Carp	Any	Sum
Average harvest rate	0.01	0.13	0.04	0.00	1.53	0.00	0.01	1.72
Upper sector harvest rate	0.02	0.14	0.04	0.00	0.00	0.00	0.00	0.21
Lower sector harvest rate	0.00	0.12	0.03	0.00	3.06	0.00	0.02	3.23

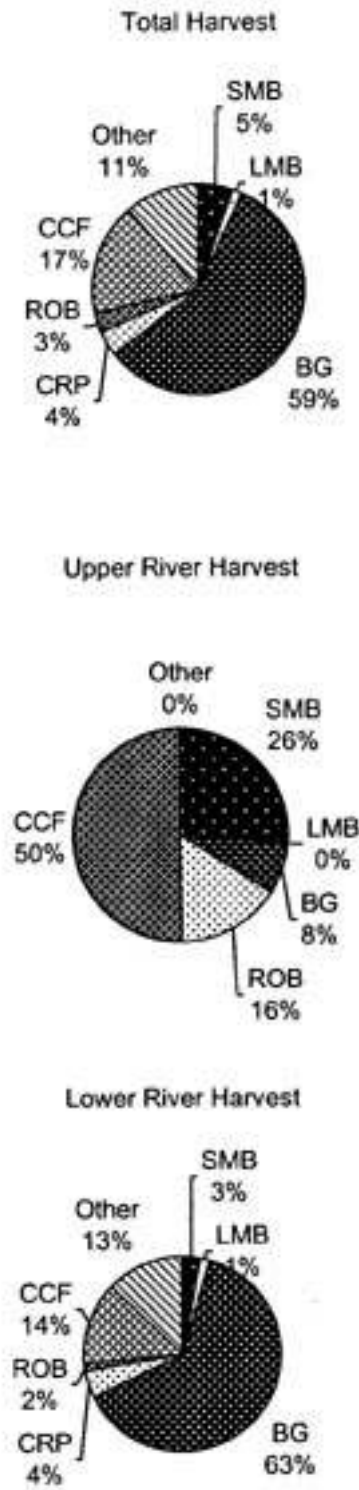


Figure 4. Harvest percentages (number of fish).



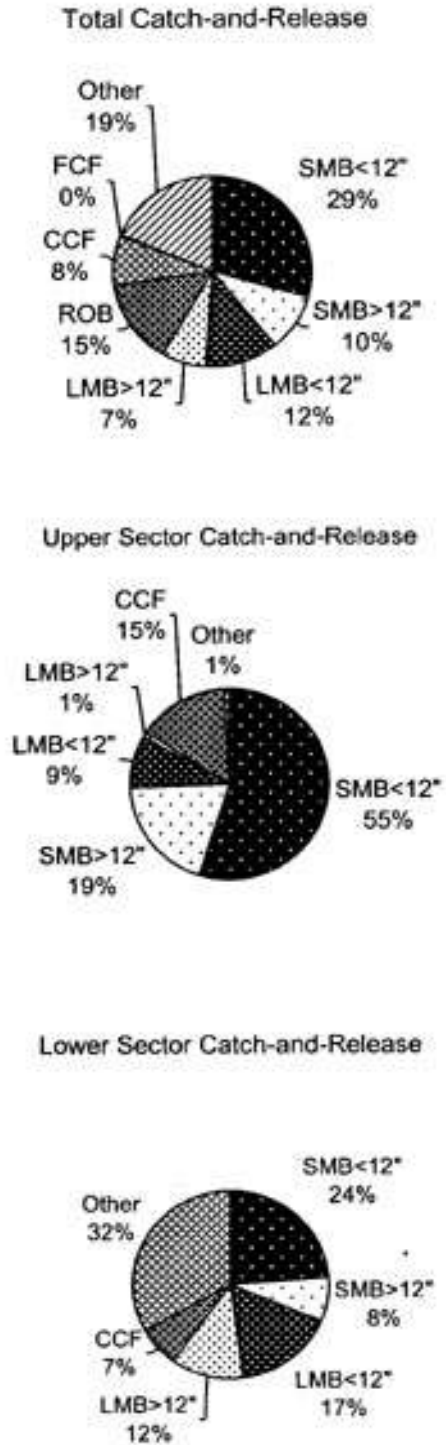


Figure 5. Catch-and-release percentages (number of fish).

## DISCUSSION

A total of 33,059 hours of angling took place on the 62-mile stretch of river. This amounts to 533 hours of angler effort per mile of river. Most of the angling occurred on the lower 13 miles of river in Marion County, which provides a user rate of 1,874 h/mi. An estimate of 2,742 h/mi was provided by a 1989 angling survey on the West Fork White River in Marion County (Kiley and Keller 1990). In a survey of a larger river with a more varied fishery, the East Fork and Mainstem White River in Indiana, Hoffman (2004b) found that angler effort was 1,271h/mi on a 128.5-mile portion. Keller (1999) found an angling effort of 159 h/mi of stream for Sugar Creek, a much smaller stream but similar to the upper WFWR in being a popular smallmouth bass fishery. Fishing effort on the Kankakee River in northern Indiana was estimated to be 1,708 h/mi (Robertson and Price 2004).

The black bass was the dominant species group in terms of interest to anglers. The smallmouth bass is one of the most abundant and widely distributed species in the river (Hoffman 2004a) and proved to be the dominant species in the angler catch-and-release numbers. Ten thousand three hundred and seventy-eight smallmouth bass were caught and released, of which 25% were over the minimum size limit of 12 in. Smallmouth bass numbers were 49% of the catch-and-release total in the upper sector, followed by rock bass at 33%. In the lower sector, smallmouth bass made up 31% of the catch-and-release, exceeded only by "other", which included carp, suckers, and yellow bass. The largemouth bass is also important in pools throughout both sectors of the river. The total number of largemouth bass caught-and-released was 5,020, of which 85% came from the lower sector. Thirty-seven percent of the largemouth bass catch-and-release total was above the 14-in minimum size limit for lakes. Largemouth bass made up less than 1% of total fish harvested for the upper sector and about 1% in lower sector.

The high rate of catch-and-release fishing and low harvest estimate for largemouth and smallmouth bass indicate that the harvest of these two species is not affecting their populations significantly. Growth of smallmouth bass in the WFWR, while higher than that for the Indiana Fisheries Management District 5, was normal compared to other mid western states (Hoffman 2004a and Carlander 1977). This suggests that the habitat available for smallmouth bass in the WFWR is approximately in line with the present population and overharvest is not occurring. Therefore, the present 12-inch minimum size limit is adequately protecting the resource.

Bluegill accounted for 54% of the harvest, and angling for this species occurred in both sectors of the river. However, the lower sector had two large gravel pits and two impoundments that provided most of the fishing activity for this species. The second most important fish in the harvest was the channel catfish at 17%.

Both channel and flathead catfish have been stocked extensively in the fish kill portion of the river beginning in 2000. Stockings to August 2002 included 1,839 flathead catfish (all

adults) and 288,700 channel catfish (including 554 adults). The near-absence of the flathead catfish in the angler catch may be due to the timing of the survey early in the stocking history. The survey scheduled for 2004 may show a better return on this species. Reproduction of both of these catfish is evidenced by the collection of juveniles and small adults in survey sampling of the WFWR (Hoffman 2004a).

Additional public access would increase fishing and other recreational activity. Many anglers complained about poor shoreline access and inadequate parking, especially at the 16<sup>th</sup> Street Dam. In some cases, just cutting weeds down to provide better access to the shore for bank anglers would help. In the urban areas of Marion County, bank fishing is highly important. Some improvements have been made since 2002. For example, a fishing pier was completed at Broad Ripple Park and a new private canoe livery was added at Raible Avenue Bridge in Anderson.

At \$33 per user visit for Indiana resident anglers (U.S. Department of the Interior, Fish and Wildlife Service 2003), the total recreational value of the fishing to the economy was \$342,573. This amounts to \$5,525 per mile for the 62-mile reach that was surveyed. This value is conservative of the true value of angling for this portion of the river since this was a conservative estimate of the number of user visits, and occurred only two years after the fish kill.

The problem with high bacterial loading has caused local governments to occasionally issue warnings against fishing and full-body contact with the water. One warning occurred in the early fall of 2004 in Hamilton County. This suggests that there is still untreated sewage reaching the river. Ending this problem is crucial to increased use of the river.

Encouraging more people to use the river should benefit it by broadening the public support of environmental protection and improvements. One example of encouraging use is the new public access at Rocky Ripple Town Hall and the bank improvements at Arden Avenue, Indianapolis. Friends of the White River, a nonprofit organization, did both of these projects.

The recreational survey of the WFWR will be repeated in 2004. Final recommendations for the upper WFWR will await the new survey results.

## LITERATURE CITED

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## Appendix 1. Sections and stations for the 2002 recreational survey of the West Fork White River.

Section	Sta.	Station Name	Location / comment	Probability
<u>Sector 1</u>				
1	1	16 <sup>th</sup> St. Dam	East side of river	0.18
	2	16 <sup>th</sup> St. Dam	West side of river	0.17
	3	Riverside Park	Parking area, bank fishing	0.11
	4	Riverside Park	Public boat ramp	0.20
	5	30 <sup>th</sup> St.	Restaurant, shore W side	0.14
	6	I-65 overpass	Shore access under overpass	0.19
2	7	Holliday Park	Handicap ramp	0.12
	8	College Ave. Bridge	Shore access at bridge	0.12
	9	Marott Park	Canoe portage at park	0.23
	10	Broad Ripple Park	Public boat ramp	0.20
	11a	73 <sup>rd</sup> St.	Ravenswood "Beach"	0.16
	11b	86 <sup>th</sup> St. Bridge <sup>1</sup>	Parking lot at NW side bridge	0.16
	12	Town Run Park	96 <sup>th</sup> St.	0.16
<u>Sector 2</u>				
1	1	106 <sup>th</sup> St. Park	County park W side	0.24
	2	116 <sup>th</sup> St.	City boat ramp	0.20
	3	Schwartz's Bait and Tackle	Fishing pier at shop	0.13
	4	Public boat ramp	Upstream of St Rd 38 bridge	0.17
	5	Golf Course	Noblesville near St Rd 19	0.10
	6	Potters Bridge	County park	0.17
2	7	Clare Dam	At Riverwood, W side river	0.01
	8	Riverwood Boat Ramp	Just upstream of Clare Dam	0.13
	9	Riverbend Campground	Private boat ramp	0.26
	10	White River Campground	County campground	0.24
	11	Raible Ave. Bridge <sup>2</sup>	Shoreline access	0.17
	12	Edgewater Park	Anderson City Park	0.17
	13	Mounds State Park	Canoe launch, shore access	0.19

<sup>1</sup>86<sup>th</sup> St. station was replaced with 73<sup>rd</sup> St. station on June 1.

<sup>2</sup>Raible Ave. Bridge station was replaced with Edgewater Park on June 1.

## Appendix 2. Recreational use by month of West Fork White River access sites in 2002.

Upper		Recreational					Hiking & Parking		Totals
Sector	Category	Fishing	Boating	Picnicing	Bicycling	Jogging	walking	& Misc.	
Apr.	User visits	88	47	13	57	463	468	7	1,143
	User hours	256	232	40	143	1173	1444	40	3,328
May	User visits	174	347	40	205	136	531	486	1,919
	User hours	505	378	49	268	202	713	775	2,890
June	User visits	793	1231	53	212	50	430	54	2,823
	User hours	2301	2243	86	304	68	617	145	5,764
July	User visits	1084	1718	0	387	156	327	0	3,672
	User hours	3143	2229	0	542	203	420	0	6,537
Aug.	User visits	304	967	0	506	244	857	13	2,891
	User hours	883	1490	0	765	330	1231	14	4,713
Sep.	User visits	506	1459	0	804	51	1692	386	4,898
	User hours	1467	1901	0	1134	74	2517	1529	8,622
Oct.	User visits	49	384	0	536	170	1352	0	2,491
	User hours	142	817	0	802	248	1971	0	3,980

Lower		Recreational					Hiking & Parking		Totals
Sector	Category	Fishing	Boating	Picnicing	Bicycling	Jogging	walking	& Misc.	
Apr.	User visits	402	103	18	0	0	0	965	1,488
	User hours	1327	259	34	0	0	0	3939	5,559
May	User visits	438	368	52	160	12	115	1093	2,238
	User hours	1445	1173	323	626	28	347	3397	7,339
June	User visits	1702	1445	142	1177	0	204	1013	5,683
	User hours	5615	3755	550	5213	0	1008	3746	19,887
July	User visits	1702	1688	227	1050	0	195	880	5,742
	User hours	5615	3549	1127	5239	0	565	3195	19,290
Aug.	User visits	1253	502	300	885	13	262	772	3,987
	User hours	4136	2453	1433	3189	39	746	2219	14,215
Sep.	User visits	1030	1015	261	1008	41	248	872	4,475
	User hours	3398	1633	946	3794	200	618	2379	12,968
Oct.	User visits	857	638	23	875	77	248	1131	3,849
	User hours	2827	1414	103	3326	162	579	2150	10,561

## Appendix 3. Number of fish harvested by month and sector.

Upper Sector	SMB*	LMB*	BG	CRP	ROB	CCF	FCF	YEB	CCP	SUC	Tot. Fish
Apr.	0	0	0	0	0	0	0	0	0	0	0
STDV											0.00
May	0	0	0	0	0	0	0	0	0	0	0
STDV											0.00
June	188	0	0	0	94	377	0	0	0	0	660
STDV	0.56				0.40	1.41					1.61
July	20	0	61	0	0	0	0	0	0	0	82
STDV	0.14		0.44								0.46
Aug.	0	0	0	0	0	20	0	0	0	0	20
STDV						0.31					0.31
Sep.	0	0	0	0	0	0	0	0	0	0	0
STDV											0.00
Oct.	0	0	0	0	28	0	0	0	0	0	28
STDV					1.34						1.34

Lower Sector	SMB*	LMB*	BG	CRP	ROB	CCF	FCF	YEB	CCP	SUC	Tot. Fish
Apr.	0	0	3188	0	0	91	0	0	91	0	3370
STDV			13.23			0.38			0.38		13.12
May	0	0	46	46	46	46	0	92	0	0	229
STDV			0.22	0.22	0.22	0.22		0.44			0.62
June	66	66	329	197	66	460	0	395	0	66	1644
STDV	0.12	0.12	0.39	0.26	0.12	0.48		0.71		0.12	1.91
July	55	11	110	33	0	132	11	0	0	0	351
STDV	0.29	0.10	0.57	0.29		0.64	0.10				1.29
Aug.	47	31	140	31	0	109	16	0	47	47	465
STDV	0.27	0.24	0.98	0.17		0.55	0.12		0.36	0.27	1.38
Sep.	49	0	857	0	0	98	0	73	49	0	1126
STDV	0.29		3.54			0.35		0.43	0.29		3.73
Oct.	0	0	23	11	0	69	0	46	0	0	149
STDV			0.36	0.18		0.91		0.56			1.69

\*Abbreviations: SMB=smallmouth bass, LMB=largemouth bass, BG=bluegill, ROB= rock bass, CCF=channel catfish, FCF=flathead catfish, YEB=yellow bass.



## Appendix 4. Number of fish caught-and-released by month and sector.

## Upper Sector

	SMB* <12"	SMB* ≥12"	LMB* <14"	LMB* ≥14"	ROB	CCF	FCF	Other	Tot. Fish
Apr.	0	0	0	0	0	0	0	0	0
STDV									0.00
May	0	0	0	0	0	0	0	0	0
STDV									0.00
June	37	116	19	0	37	5	0	0	214
STDV	0.80	3.33	0.55		1.60	0.20			5.18
July	664	66	49	8	676	268	0	29	1,761
STDV	6.36	1.58	1.48	0.20	5.96	5.04		0.88	13.80
Aug.	867	258	116	37	867	173	0	0	2,318
STDV	5.72	2.37	2.00	0.83	6.62	2.61			12.65
Sep.	141	22	30	0	89	22	0	0	303
STDV	3.71	1.22	1.21		4.90	1.22			6.18
Oct.	48	40	29	0	0	43	0	0	160
STDV	6.50	4.47	3.49			6.10			19.86

## Lower Sector

	SMB* <12"	SMB* ≥12"	LMB* <14"	LMB* ≥14"	ROB	CCF	FCF	Other	Tot. Fish
Apr.	8	8	8	33	0	0	0	0	58
STDV	0.38	0.38	0.38	1.51					1.41
May	0	14	0	14	0	0	0	0	28
STDV		0.65		0.65					1.31
June	94	52	79	47	16	110	0	142	541
STDV	0.69	0.70	1.01	0.84	0.26	2.13	0.00	1.47	0.87
July	805	137	798	216	0	65	22	424	2,466
STDV	2.16	0.57	2.20	0.84		0.62	0.29	2.27	4.97
Aug.	215	69	90	55	21	97	0	686	1233
STDV	1.20	0.58	0.63	0.66	0.27	0.59		4.79	5.63
Sep.	116	33	33	22	0	33	0	187	424
STDV	1.89	0.73	0.73	0.35		0.39		1.89	3.51
Oct.	184	83	46	267	0	18	0	350	947
STDV	1.36	1.27	0.45	3.99		0.25		3.16	6.08

\*Abbreviations: SMB=smallmouth bass, LMB=largemouth bass, ROB= rock bass, CCF=channel catfish, FCF= flathead catfish, "Other" includes all other species caught-and-released.